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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,974	04/21/2004	Duane R. McGregor	JJK-0407 (P2003J058)	5355
27810	7590	08/04/2006	EXAMINER	
EXXONMOBIL RESEARCH AND ENGINEERING COMPANY P.O. BOX 900 1545 ROUTE 22 EAST ANNANDALE, NJ 08801-0900			SINGH, PREM C	
			ART UNIT	PAPER NUMBER
			1764	

DATE MAILED: 08/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/828,974

Applicant(s)

MCGREGOR ET AL.

Examiner

Prem C. Singh

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>05/06/05, 12/16/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The claims are drawn to a catalytic cracking process but the title is not disclosing that it is a catalytic cracking process.

The following title is suggested:

"Fluidized bed catalytic cracking with reduced NO_x using regenerator additives".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 1764

Claims 1-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yaluris et al (US Patent 6,660,683).

Claims 1, 18-20, and 37-38.

Yaluris invention discloses, "The significant steps in the cyclic FCC processes are:

(i) the feed is catalytically cracked by contacting feed with a source of hot, regenerated cracking catalyst to produce an effluent comprising cracked products and spent catalyst containing coke and strippable hydrocarbons;

(ii) the effluent is discharged and separated normally in one or more cyclones, into a vapor phase rich in cracked products and a solids-rich phase comprising the spent catalyst;

(iii) the vapor phase is removed as product and fractionated in the FCC main column and its associated side columns to form gas and liquid cracking products including gasoline;

(iv) the spent catalyst is stripped, usually with steam, to remove occluded hydrocarbons from the catalyst, after which the stripped catalyst is oxidatively regenerated in a catalyst regeneration zone to produce hot, regenerated catalyst, which is then recycled to the cracking zone for cracking further quantities of feed."

(Column 11, lines 13-35).

Yaluris further discloses, "Preferably, the amount of the compositions used is an amount sufficient to reduce the content of gas phase reduced nitrogen species in the

Art Unit: 1764.

flue gas of an FCCU regenerator operated in a partial or incomplete mode of combustion. In order to remove coke from the catalyst, oxygen or air is added to the regeneration zone." (Column 11, lines 58-67).

Yaluris adds, "By removing the gas phase reduced nitrogen species from the effluent of the FCCU regenerator, significant reduction of NO_x emissions from the CO boiler is achieved. In some cases, NO_x reduction up to 90% is readily achievable." (Column 12, lines 10-15).

Yaluris invention also discloses the composition of the NO_x reducing catalyst, which comprises, " (i) an acidic metal oxide which contains substantially no zeolite; (ii) an alkali metal, alkaline earth metal, and mixtures thereof, measured as the metal oxide; (iii) an oxygen storage component, and (iv) a noble metal component." (Column 4, lines 30-35). "Additional materials optionally present in the compositions of the present invention include, but are not limited to, fillers, binders, etc." (Column 7, lines 62-64). "Where compositions of the invention are integrated into the FCC catalyst particles themselves, any conventional FCC catalyst particles may be used." (Column 10, lines 62-65).

Although Yaluris does not specifically mention the flue gas analysis, the invention does disclose that the 90% NO_x is being reduced in the process and therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify Yaluris invention and measure the composition of CO and NO_x in the regenerator effluent gases for an efficient capture of NO_x in the catalytic cracking process.

Claims 2, 3, 21, and 22.

Yaluris discloses, "In a preferred embodiment of the invention, compositions of the invention are used in the FCC process as separate additives." (Column 4, lines 35-37). "Where compositions of the invention are integrated into the FCC catalyst particles themselves, any conventional FCC catalyst particles may be used." (Column 10, lines 62-65).

Claims 4 and 23.

Yaluris discloses, "The acidic metal oxide may be crystalline or amorphous." (Column 6, line 40). "The acidic metal oxide may contain other stabilizing metal oxides." (Column 6, lines 33-34).

Claims 5 and 24.

Yaluris discloses, "The oxygen storage component may be any metal oxide having oxygen storage capability." (Column 7, lines 14-15).

Claims 6 and 25.

Yaluris discloses, "Alkali metals useful to prepare the compositions of the invention include, but are not limited to, sodium, potassium, cesium, lithium, and the like." (Column 6, lines 61-64).

Art Unit: 1764

Claims 7, 8, 26, and 27.

Yaluris discloses, "The noble metals include platinum, palladium, iridium, rhodium, osmium, or ruthenium, rhenium, and mixtures thereof." Column 7, lines 45-48).

Claims 9-11, 28-30.

Yaluris discloses, "Preferably, the amount of the acidic metal oxide component ranges from about 5 to about 98% of the total composition." (Column 6, lines 45-51). Yaluris also discloses the amount of alkali metals from 1-20 wt %, alkaline earth metals from 0.5 to 60 wt%, oxygen storage component from 1 to 50 wt%, and the noble metal from 0.1 ppm to 5,000 ppm (Column 6, lines 61-67; column 7, lines 1-60).

Although Yaluris does not specifically mention the ratio of solid acid component to the total weight of metal-containing component, it would have been obvious to one skilled in the art at the time the invention was made to modify Yaluris invention and determine the claimed ratios for proper formulation of the NO_x additive composition in the FCC process.

Claims 12-17 and 31-36.

Yaluris discloses, "Where compositions of the invention are integrated into the FCC catalyst particles themselves, any conventional FCC catalyst particles may be used." (Column 10, lines 62-65). "Conventional FCC catalysts include, for example, zeolite based catalysts with a faujasite cracking component. Typically the FCC catalysts consist of a binder, usually silica, alumina, or silica alumina, a Y-type zeolite and fillers

Art Unit: 1764

such as kaolin clay. The Y zeolite may be present in one or more forms and may have been ultra stabilized and/or treated with stabilizing cations." (Column 11, lines 36-49).

Although Yaluris does not specifically mention the ZSM type, medium pore zeolites, it would have been obvious to one skilled in the art at the time the invention was made to add medium pore or ZSM type zeolites also in the cracking component because they are functionally similar to Y zeolites as cracking components and expected to perform equivalently as faujasite and Y zeolites.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Buchanan, US Patent 5,705,053.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prem C. Singh whose telephone number is 571-272-6381. The examiner can normally be reached on MF 6:30 AM-3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1764

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ps/072106

A handwritten signature, possibly reading "Lam", is written in black ink above a horizontal line.